REMARKS

The claims have been amended to eliminate improper multiple claim dependencies. Entry of the amendment is respectfully requested.

Objection to Claims 8-15

On page 2 of the Office Action, in paragraph 1, the Examiner has objected to claims 8-15 as being in improper form because a multiple dependent claim should refer to other claims in the alternative only and cannot depend from any other multiple dependent claim.

In response, Applicant has amended the multiple dependent claims so that they do not depend from any other multiple dependent claim. Also, Applicant submits that the multiple dependent claims refer to other claims in the alternative only (see MPEP 608.01(n)I.A., which sets forth acceptable multiple dependent claim wording).

Thus, Applicant submits that this objection has been overcome, and withdrawal of this objection is respectfully requested.

Anticipation Rejection

On page 2 of the Office Action, in paragraph 3, claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Yang et al. (Talanta 55, pp. 1091-96).

The Examiner's Position

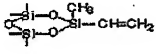
The Examiner's position with respect to claims 1-3 is that Yang teaches a method of coating a silica particle with a cationic exchange film comprising the steps of: coating the silica beads with methylvinyldiethoxysilane (claimed polymer having a double bond, p. 1092, Col. 2)

and placing the coated beads in a solution comprising maleic anhydride to co-polymerize the coating on the silica particles to form a film (claimed crosslinking, p. 1092, Col. 2). As to claims 4-7, the Examiner indicates that Yang also teaches the use of poly(butadiene-maleic acid) polymers in place of the methylvinyldiethoxysilane polymers (p. 1091, Col. 2 - p. 1092, col. 1).

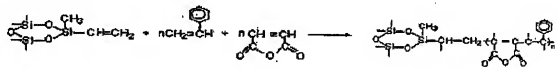
Applicant's Response

In response, Applicant notes that Yang et al. disclose a method of preparing silica-based cation exchange resin. Firstly, silica and methylvinyldiethoxysilane (hereinafter referred as MVES) were reacted in toluene solution to bond MVES to silica, and the resulting compound is named MVDS (page 1092 right column lines 10 to 16).

MVDS:



Then, MVDS was copolymerized with styrene and maleic anhydride to give a polymer (same column lines 9 to 6 from the bottom).



This copolymerization is generally called graft polymerization.

That is, an invention disclosed in Yang et al. is a silica-based cationic ion exchange resin obtained by copolymerizing MVDS, which is obtained by bonding MVES to carrier (silica), with styrene and maleic anhydride and a process to obtain it.

In contrast, the process of the present invention requires two steps, as follows.

Step (1) is coating a polymer having a double bond within the molecule on a support.

MVDS is not a polymer but merely a compound in which MVES is bonded to silica carrier.

The Examiner contends that MVDS is the claimed polymer having a double bond, but this is not correct since MVDS is not a polymer for the reason described above.

Thus, Yang at al. do not disclose or suggest the claimed step (1) of the invention of coating a polymer having a double bond within the molecule on a support.

Further, Yang at al. do not even suggest the claimed step (2) of the invention.

Although the Examiner contends that Yang at al. teach the use of poly(butadiene-maleic acid) polymers in place of the MVES polymers, such is not correct (see the further discussion in this regard on the next page), and thus Yang et al. do not disclose a process including the step (1) and (2) of the present invention.

Therefore, a film production process disclosed in Yang et al. is totally different from the present invention, and thus Claim 1, its dependent claims 2 to 12 and claims 13 to 15, which are a film, a weakly acidic cation exchanger and a column for cation chromatography using the ion exchange resin produced by the process, are patentable over Yang et al.

In other words, methylvinyldiethoxysilane (cited by the Examiner as corresponding to the recited polymer having a double bond that is coated on a support) is not actually a polymer, contrary to the Examiner's indication (see, e.g., the Si-containing reactant shown in the first reaction near the bottom of the right column on page 1092; unlike, e.g., the product at the bottom of the right column on page 1092, the Si-containing reactant does not include a parenthetical section with a subscripted "n" indicating a repeating unit of a polymer). Accordingly, Yang does not teach or suggest the recited step of coating a polymer having a double bond within the molecule on a support.

Also, contrary to the Examiner's position, Yang does not teach or suggest the use of poly(butadiene-maleic acid) polymers in place of the methylvinyldiethoxysilane polymers (p. 1091, Col. 2 - p. 1092, col. 1). First, as discussed above, the methylvinyldiethoxysilane disclosed in Yang is not a polymer. Second, the poly(butadiene-maleic acid)-coated silica in the introduction of Yang would correspond to the maleic acid-styrene encapsulated silica in Yang (see, e.g., the title of Yang); that is, Yang seems to teach the use of maleic acid-styrene in place of butadiene-maleic acid, not the use of methylvinyldiethoxysilane in place of butadiene-maleic acid. Accordingly, the Examiner's position is inappropriate in this regard as well.

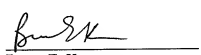
Thus, Applicant submits that the present invention is not anticipated by (or obvious over) Yang et al., and withdrawal of this rejection is respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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